



Defense Energy Support Center

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**Product
Technology
&
Standardization
Division**

Alternative Fuels Information Station

Biodiesel Fuel Tutorial (with EPA Act 2005 Updates)





Learning Objectives



You should learn....

- The definition of biodiesel fuel and biodiesel fuel blends
- The role of biodiesel fuel as an EPCRA 1992 and EPCRA 2005 alternative fuel
- How Biodiesel and EPCRA 2005 effect DoD Operations
- How biodiesel fuel is made
- The advantages and disadvantages of using biodiesel fuel
- Physical and chemical properties of biodiesel fuel/B20 biodiesel blends
- The handling and storage requirements for biodiesel (logistics)





Biodiesel Fuel Grade Definitions





BIODIESEL AND BIODIESEL BLENDS



PRODUCT DEFINITIONS

BIODIESELS- Mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats

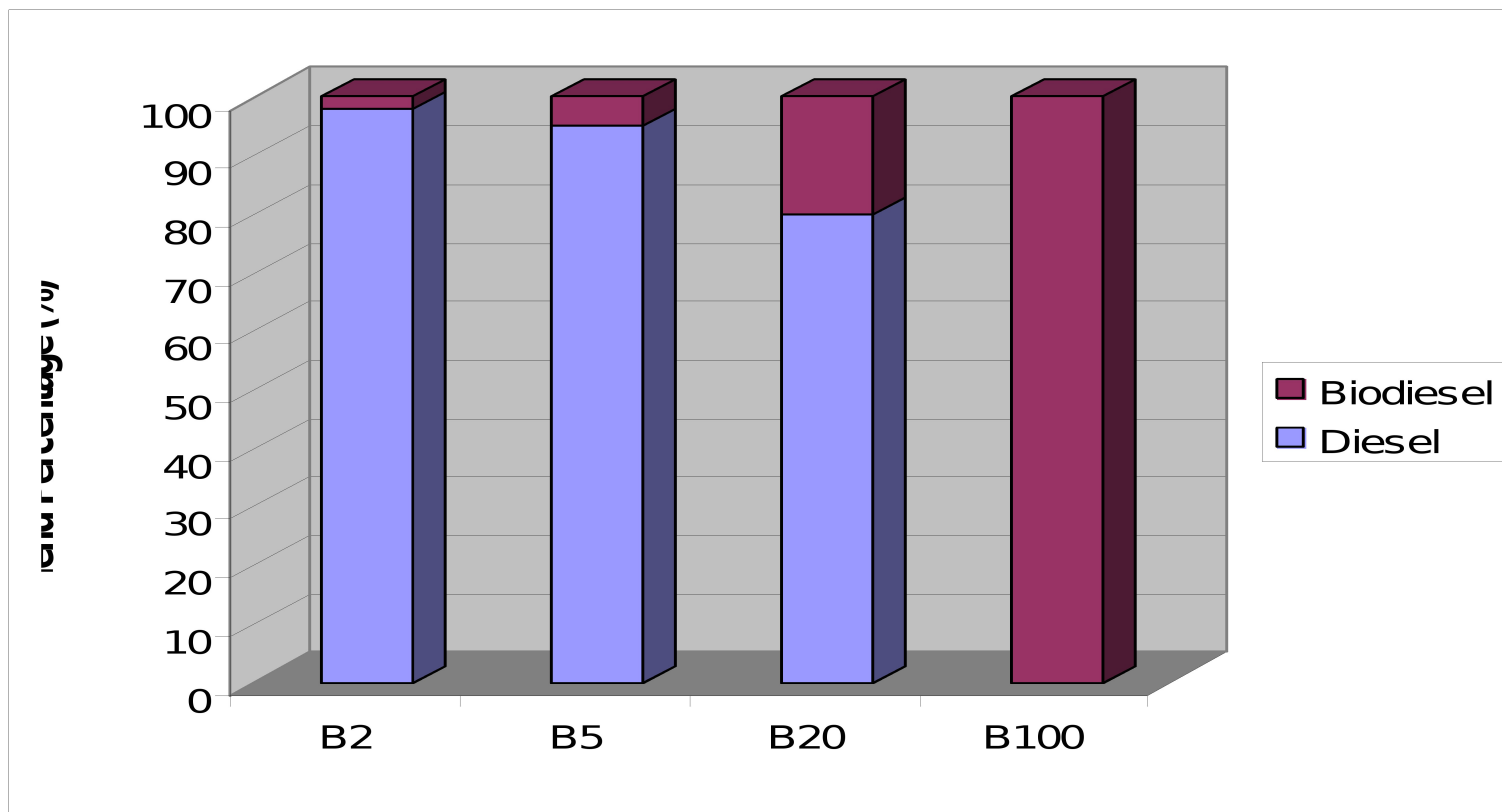
BIODIESEL BLENDS (Bxx)- Blends of biodiesel fuel with petroleum based diesel fuel.

Reminder: Diesel Fuel is a middle distillate fuel designed (per ASTM D 975) for diesel engines





BIODIESEL AND BIODIESEL BLENDS



Example: B5 is 5% biodiesel & 95% diesel





BIODIESEL AND BIODIESEL BLENDS



Accepted technical specification....

- Biodiesel (B100) ASTM Specification D-6751
For Biodiesel Fuel Blend Stock for Distillate Fuels
Commonly used as a blend stock with petroleum based diesel fuels and is registered with EPA under 40CFR79
- Biodiesel Blend (B20)
B100 fuel blended with 80 percent petroleum diesel fuel oils, grade low sulfur number 1-D or grade sulfur 2-D (ASTM D





Role of EPAct 2005 On Biodiesel Fuel





Using Biodiesel Fuel to Comply with EPAct



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Energy Policy Act 2005



Energy Policy Act 1992



**E.O. 13423:
Strengthening Federal Environmental, Energy,
And Transportation Management**





Biodiesel and EPA Act 2005



Energy Policy Act of 2005

- Authorizes \$50 million annually over the life of the bill for a biomass grant program;
- Requires that Federal Fleet vehicles capable of operating on alternative fuels be operated on these fuels exclusively (Section 701.)





Biodiesel and EPAct 2005



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Energy Policy Act of 2005



Programs established under EPAct 2005

Pilot Program for Advanced Vehicles (Section 722)

Establishes grants to state and local governments to subsidize
The procurement of alternative fueled vehicles and infrastructure support

Biodiesel Engine Testing Program (Section 757)

Authorizes \$5M for FY 06 to FY 2010 each year for diesel engine manufacture and biodiesel fuel providers to execute joint testing including advanced diesel engines and fuel system technologies





Biodiesel and EPO Act 2005



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Energy Policy Act of 2005



Programs established under EPO Act 2005

Bioenergy Program (Section 932)

Sets up research and development programs toward developing integrated Biorefineries.

Amendments to Biomass Research and Development (Section 941)

Introduces four new R&D areas to Biomass R&D Act of 2000

- (1) develop crops and systems that improve feedstock production
- (2) convert cellulosic biomass into intermediates which can be used to m
- (3) develop general technologies that increase feasibility of biofuel prod
- (4) analyze biomass technologies for quality, sustainability, and rural de





Biodiesel and EPO Act 2005



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Energy Policy Act of 2005



Programs established under EPO Act 2005

Production Incentive for Cellulosic Biofuels (Section 942)

Authorizes incentives to ensure that annual production of one billion gallons of cellulosic biofuel is achieved by 2015.

Alternative Motor Vehicle Credit (Section 1341)

Provides tax credits to purchasers of new dedicated AFVs. The tax credit equals 50% of the incremental cost of the vehicle.





EPAct 2005, Biodiesel, and DoD



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Section 701 Federal Fleet Dual-Fuel Vehicles: Fuel Use Requirement

Requires dual fuel vehicles acquired for federal fleets applicable to the EPAct to operate solely on alternatives (unless a special Secretary of Energy waiver is obtained).

Section 702 Federal Fleets Incremental Cost Distribution

**Requires the US GSA and other federal agencies that procure vehicles for fleets to spread the incremental vehicle costs of all vehicles. Mandate modifies (EPAct 1992, Section 303)-
Editorial Change**

Section 703 Alternative Compliance for State and Alternative Fuel Provider Fleets

Expands compliance options under EPAct 1992 by allowing fleets to choose a petroleum reduction path in lieu of acquiring AFVs. Interested fleets must obtain a waiver from the US Dept of Energy.





EPAct 2005, Biodiesel, and DoD



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Section 704 **Review of EPAct 1992 Programs**

Requires DOE to submit a report to Congress 180 days after the enactment of this section on the number of AFVs procured and amount of alternative fuel consumed by all agencies

Section 706 **Joint Flexible Fuel/Hybrid Vehicle Commercialization Initiative**

Directs DOE to establish research programs to advance the commercialization of hybrid flexible fuel vehicles. Act requires vehicles achieve 250 miles per petroleum gallon.

Section 712 **Efficient Hybrid and Advanced Diesel Vehicles**

Directs DOE to establish a program to encourage the domestic production and sale of efficient hybrid and advanced diesel vehicles.





EPAct 2005, Biodiesel, and DoD



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Section 742 Diesel Truck Retrofit and Fleet Modernization Program

Authorizes EPA to administer a grant program for modernizing fleets and retrofitting diesel trucks to state or local governments.

Section 754 Diesel Fueled Vehicles: Meeting Tier 2 Standards

Directs DOE to accelerate efforts to ensure that diesel vehicles meet Tier 2 standards. The goal is to improve combustion and after treatment technologies and enable diesel technologies by 2010.





Using Biodiesel Fuel to Comply with EPAct



E.O. 13423:

Strengthening Federal Environmental, Energy, And Transportation Management

percedes and revokes E.O. 13101, E.O. 13123, E.O. 13134, E.O. 13148, and E.O. 13149

- Reduce greenhouse gases by 3% annually through 2015 (or by 30% from year 2003 baseline)
(section 2(a))
- Reduces consumption of petroleum products by 2% annually through end of year 2015.
- Increase total fuel consumption that is non-petroleum based by 10%
- Use hybrid vehicles where commercially available
(section 2(g))





Additional Information



- <https://www.denix.osd.mil/> (Defense Environmental and Information Exchange)(DoD strategy, Military Services AFV Reporting requirements)
- **National Biodiesel Board.**
http://www.biodiesel.org/resources/biodiesel_basics/
(What is it, How is it made)





EPAct Credits





Using Biodiesel Fuel to Comply with EPA Act



Energy Policy Act 1992

Requirement

The Energy Policy Act 1992 mandates that 75% covered vehicle acquisitions be AFVs.

Fleet Manager Goal

The fleet manager can procure according to the EPA Act requirement

OR

The fleet manager can procure a combination of AFVs and Biodiesel fuel credits



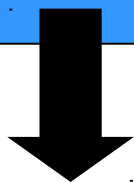


Using Biodiesel to Receive EPO Act Credits



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Energy Policy Act 1992



Credits Awarded	Situation Earning Credits
1	A light-duty, alternative fuel vehicle
2	A dedicated light-duty vehicle
3	A dedicated medium-duty, alternative fuel vehicle
4	A dedicated heavy-duty, alternative fuel vehicle
1	For every 450 gallons of pure biodiesel (equivalent to 2,250 gallons of B-20) used in diesel vehicles with earned credits of up to 50% of EPO Act requirements only.





EPAct Biodiesel Credits



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Example: Use of Bio-Diesel to acquire EPAct credits to meet the 75% yearly AFV procurement requirement of EPAct

Remember.....

* **Light Duty AFV = 1 credit**

* **75% of all covered vehicles must be AFVs**

Assume: Present Service Fleet of 40 Vehicles

- 20 Light-Duty Gasoline Vehicles
- 10 Medium Duty Diesel Vehicles
- 10 Light-Duty AFVs

Acquire 10 new cars in FY04:

- Four Light Duty Gasoline Vehicles
- Six Light Duty AFVs

	Acquisitions (FY 04)	# of New AFV Credits	Biodiesel Credits	Percentage AFV
Scenario 1	10	6	0	60%
Scenario 2	10	6	2	80%

* **The Percentage AFV is calculated in each scenario by dividing total credits earned by the total number of vehicle acquisitions for the year.**

* **Scenario 2 requires procurement of 2 x 2250 gallons of B20!**





Production Of Biodiesel





BIODIESEL AND BIODIESEL BLENDS



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Biodiesel Raw Materials

Oil or Fat

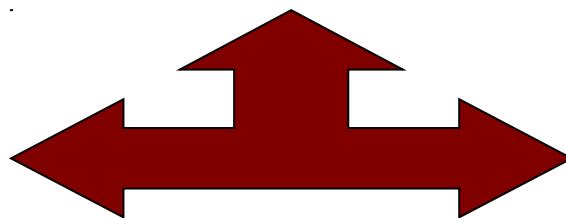
Soybean
Corn
Canola
Cottonseed
Sunflower
Beef tallow
Pork Lard
Used Cooking Oils
Others

Alcohol

Methanol
Ethanol



Catalyst
Sodium Hydroxide
Potassium Hydroxide



Reminder: Diesel Fuel is a middle distillate fuel designed (per ASTM D 975) for diesel engines

Source: www.afdc.doe.gov



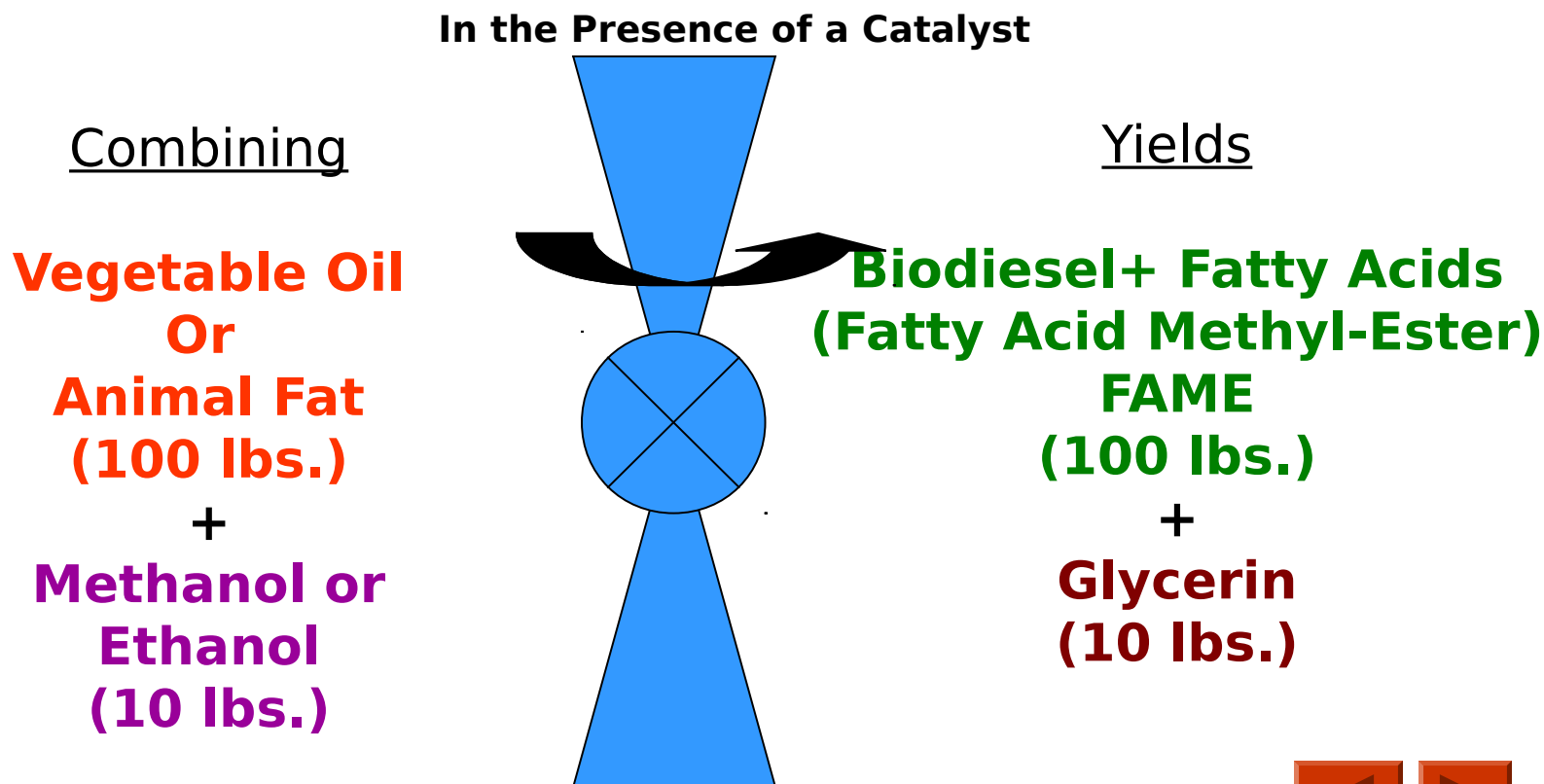


Biodiesel Reaction Sequence

BIODIESEL AND BIODIESEL BLENDS



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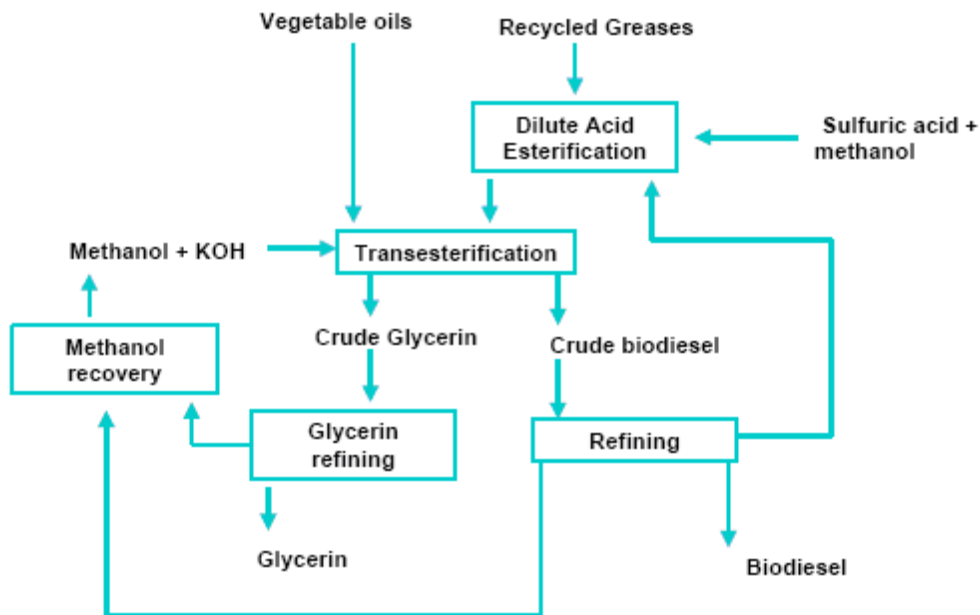
Biodiesel Reaction Sequence

BIODIESEL AND BIODIESEL BLENDS



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Basic Technology



Source: <http://www.federalsustainability.org/images/biodieselprocess.gif>



Biodiesel Properties



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Biodiesel/Biodiesel Blends

Property	Units	Test Method (ASTM)	Value	
			B100	B20
Flash Point	Deg C	D 93	130 min	38 min
Water and Sediment	% Volume	D 2709	.050 max	.05 max
Kinematic Viscosity, 40 C	mm ² /s	D 446	1.9-6.0	1.3-4.1
Sulfated Ash	% mass	D 874	.020 max	
Sulfur	% mass	D 5453	.05 max	.05 max
Copper Strip Corrosion		D 130	No. 3 max	No. 3 max
Cetane Number		D 613	47 min	40 min
Cloud Point	Deg C	D 2500	Report*	Per Table 1, D975
Carbon Residue	% mass	D 4530	.050 max	Set after add. data
Acid Number	mg KOH/g	D 664	.50 max	0.2 max
Free Glycerin	% mass	D 6584	0.02	N/A
Total Glycerin	% mass	D 6584	0.24	N/A
Phosphorus Content	% mass	D 4951	.001 max	N/A
Distillation Temperature Atmosphere Equiv. Temp 90% Recovered	Deg C	D 1160	360 max	338 max



Reference: **ASTM D6751**



Biodiesel Fuel Logistics





DESC Fuel Introduction Process (Fuel Logistics)



Acquisition Processes

- Legislative Directives
- Fuel Specification
- Procurement Education
- Quality Management

Handling & Storage Processes

- Compatibility of existing Infrastructure
- Tank Cleaning & Prep
- Storage Requirements
- Quantity Measurements
- Quality Measurement

Quality Assurance & Forecasting Processes

- Long term quality
- Ordering Strategy
- Distribution



Legislative Directives



Energy Policy Act (EPAct) 2005

Energy Policy Act (EPAct) 1992

Law attempts to combat growing energy problems, provides tax incentives and loan guarantees for energy production of various types.

EO 13423

DoD Strategy

Established National Energy Policy Goals Towards Energy Security with provisions on Energy Conservation, Environmental Preservation, Petroleum Fuel Consumption, and Alternative Fuel Usage

Supercedes EO 13149 and other related laws and sets energy goals for all agencies and empowers agency heads to set up an infrastructure to enforce and monitor compliance.

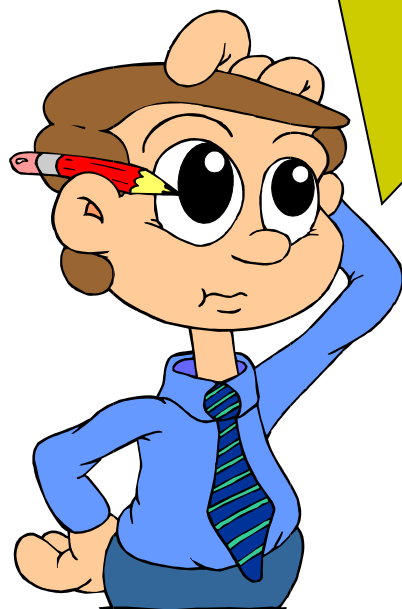
Established DoD policy for procuring Alternative Fuel Vehicles and Alternative Fuels



How Do I Acquire Alternative Fuels from DESC?



DESC buys fuel and energy products for both Military and Federal Civilian Agencies



Military groups submit Requirements to Service Energy Offices



Federal agencies submit requirements directly to DESC





What Should The Requirements Document Include?

At A
Minimum:



Location

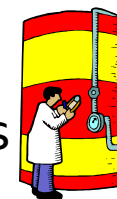


Current Point of Contact



Projected Annual Usage (Gallons)

Number & size of Tanks



Preferred Method of Delivery



Frequency of Deliveries





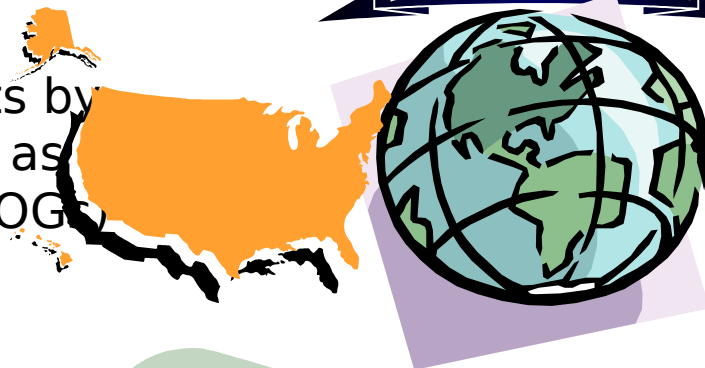
How Does DESC Purchase Alternative Fuels (e.g. B20)



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DESC consolidates requirements by Geographic regions designated as Customer Organized Groups (COGs)



Prepares solicitation packages and Advertises to potential suppliers



Suppliers bid on the entire region or specific line items





Ground Fuels Division (DESC-PE/PL)



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Customer Organized Groups (COGs)



Ground Fuels Division I (DESC-PE)
COGs 2, 3 and 4
Commercial Phone:
703-767-9509 DSN: 427-0500

Ground Fuels Division II (DESC-PL)
COGs 6, 7, 8, Alaska, Hawaii & Puerto Rico
Commercial Phone: 703-767-9521 DSN: 427-9521



DESC Fuel Introduction Process (Fuel Logistics)



Acquisition Processes

- New Fuel Justification
- Fuel Specification
- Procurement Education
- Quality Management

Handling & Storage Processes

- Compatibility of existing Infrastructure
- Tank Cleaning & Prep
- Storage Requirements
- Quantity Measurements
- Quality Measurement

Quality Assurance & Forecasting Processes

- Long term quality
- Ordering Strategy
- Distribution



Biodiesel Properties

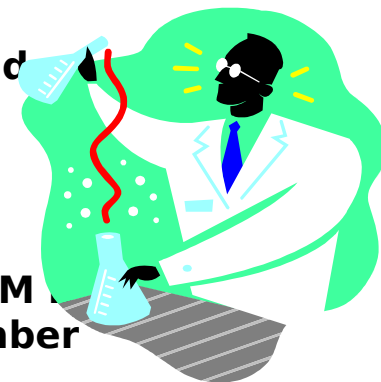


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Specification Clause C16.27 B20 Biodiesel (DESC Apr 2005)

PRODUCT COMPOSITIONAL REQUIREMENTS

1. **20% +/- 1% mono-alkyl esters of long chain fatty acids derived from virgin vegetable oil blend stock and/or yellow grease blend stock per ASTM D 6751.**
2. **80% minimum low sulfur diesel fuel oil conforming to ASTM 975, grade low sulfur number 1-D or grade low sulfur number 2-D.**





Biodiesel Properties



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Specification Clause C16.27 B20 Biodiesel (DESC Apr 2005)

SIGNIFICANT PRODUCT PERFORMANCE REQUIREMENTS

1. Conform to CID A-A59693 A- January 15, 2004

Test	Method	Value
Carbon Residue on 10% bottoms, mass %	ASTM D 524	0.35 max
Density @ 15 °C, kg/L or API Gravity @ 60 °F	ASTM D 4052 ASTM D 1298	Report
Distillation Temperature, °C 10% point, °C 50% point, °C	ASTM D 86	Report





Biodiesel Properties



Per Specification Clause C16.27 B20 Biodiesel (DESC Apr 2005)

PRODUCT LOW TEMPERATURE PERFORMANCE



1. Lower temperature defined by 1 of the 2 properties: Cloud Pt, Cold Filter Plugging Point (CFPP)
2. Cloud Point tested per ASTM D 2500 $< \text{or} = 10^{\text{th}}$ percentile minimum ambient temperature in the geographical area and seasonal timeframe in which the B20 is to be used, when tested per ASTM D 975
3. Max CFPP of the B20 shall be a minimum of 10 degrees Celsius below 10^{th} percentile minimum ambient temperature in the geographical area and seasonal timeframe in which the B20 is to be used, when tested per ASTM D 6371





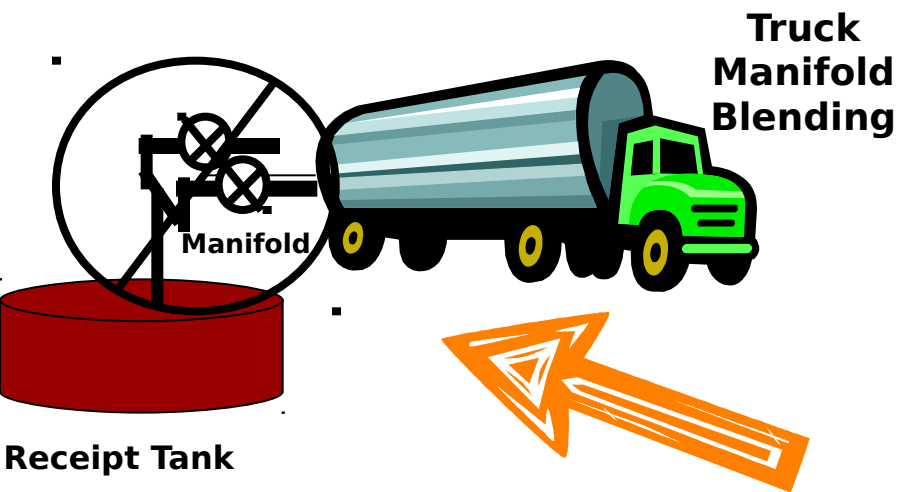
Biodiesel Quality Assurance



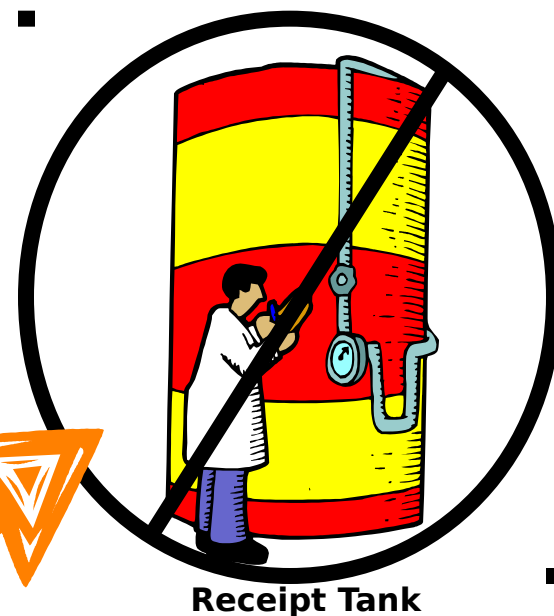
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Techniques NOT permitted by DoD Specification

Product shall be blended PRIOR to delivery ONLY!!!!



Blending
In
Receipt
Tanks



NOTE: AFTER FIRST SHIPMENT OF BIODIESEL, FILTERS SHOULD BE CHECKED AND MAY NEED
TO BE CHANGED DUE TO THE CLEANING CAPABILITIES OF THE BIODIESEL PRODUCT.

REQUIRED B100 PRODUCT MUST BE EPA REGISTERED IN ACCORDANCE WITH 40 CFR PART 79,
REGISTRATION OF FUELS AND FUEL ADDITIVES. EPA REGISTRATION LETTER

AT TIME OF CONTRACT OFFER TO CONTRACTOR.





Solicitation Package Contents



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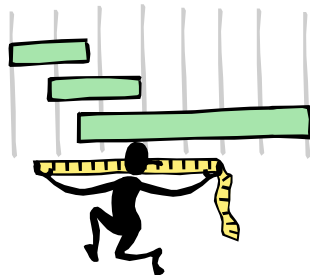
Informs potential suppliers of the terms and conditions for bidding.....



Fuel Specifications



Quality Assurance Provisions



Quantity Measurements



Delivery Requirements

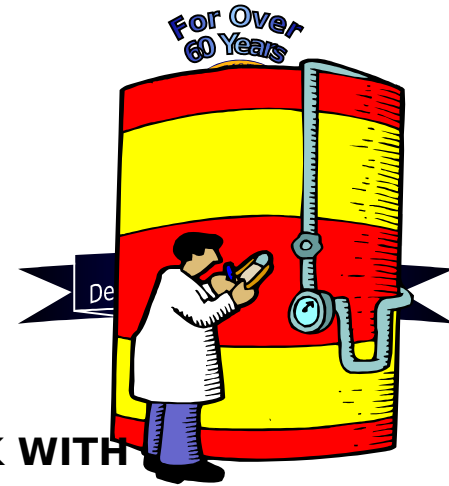


Points of Contact



Biodiesel Fuel Management

Fuel Tank Cleaning Requirements



USE EXISTING DIESEL TANKS

- (1) **DETERMINE AMOUNT OF WATER IN THE TANK WITH WATER FINDING PASTE.**
- (2) **LOOK AT WATER FINDING PASTE FOR ANY CLUMPS OF SLUDGE OR SEDIMENT AND FROM THIS, ESTIMATE LEVEL OF SLUDGE OR SEDIMENT IN THE BOTTOM OF THE TANK.**
- (3) **IF TANK DOES NOT CONTAIN MORE THAN 1/4 INCH OF WATER AND LESS THAN 1/2 INCH OF TOTAL WATER, SLUDGE AND SEDIMENT, THEN DRAW THE TANK DOWN AS LOW AS POSSIBLE AND REFILL WITH BIODIESEL.**
- (4) **IF WATER/SLUDGE/SEDIMENT LAYER IS GREATER THAN 1/2 INCH, ATTEMPT TO DRAIN AS MUCH AS POSSIBLE. IF IT CAN BE DRAINED TO THE REQUIREMENTS IN 3 ABOVE, THEN DO SO. THEN DRAW THE TANK DOWN AS LOW AS POSSIBLE AND REFILL WITH BIODIESEL.**
- (5) **IF DRAINING CANNOT BE ACCOMPLISHED, THEN THE TANK SHOULD BE CLEANED BEFORE PUTTING BIODIESEL IN THE TANK.**



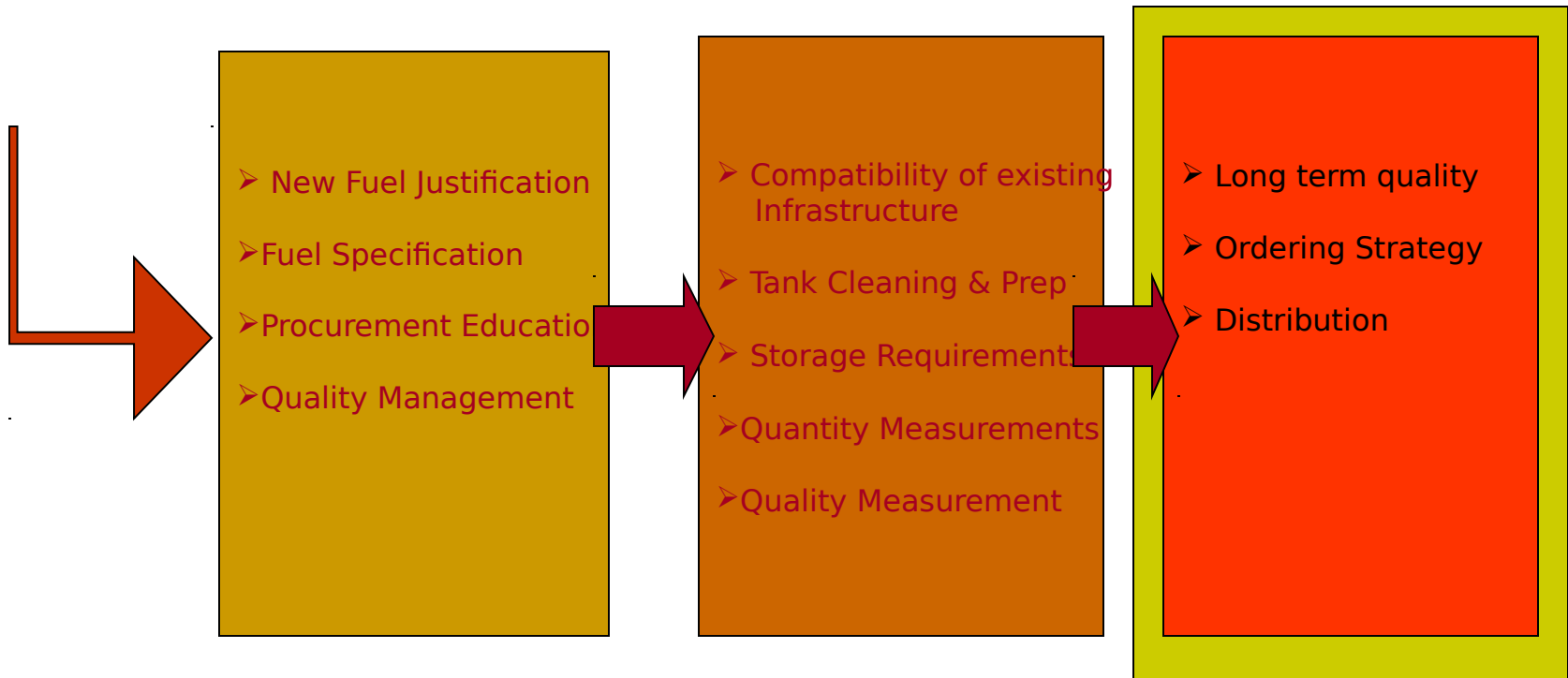
DESC Fuel Introduction Process (Fuel Logistics)



Acquisition Processes

Handling & Storage Processes

Quality Assurance & Forecasting Processes





How does the government determine the quantity of a fuel delivery?



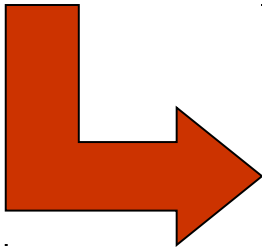
Government Determination

DESC ground fuel customers receive fuels by 3 transportation modes:

Transport Truck with meter

Truck & Trailer with meter

Tank Wagon (equipped with meter by default)



Receiving government entity determines fuel quantity

1. Meter measurement

OR

2. Weight (using calibrated scales)

OR

3. Calibrated meter on receiving tank system

Note: Quantity measurement and delivery conditions are defined in F1.01-1 ***“Delivery Conditions for Transport Trucks and Trailers, and Tank Wagons”*** in DESC Ground Fuel Contracts.



How does the government determine the quantity of a fuel delivery?

Contractor Determination



Contractor may determine fuel quantity by:

1. Calibrated meter on the delivery conveyance
OR
2. Gauging the delivery conveyance
OR
3. Certified receiving tank markers
OR
4. Load rack meter or calibrated scales

Note: Quantity measurement and delivery conditions are defined in F1.01-1 ***“Delivery Conditions for Transport Trucks and Trailers, and Tank Wagons”*** in DESC Ground Fuel Contracts.



Quality Assurance Requirements



Contractor Quality Activities



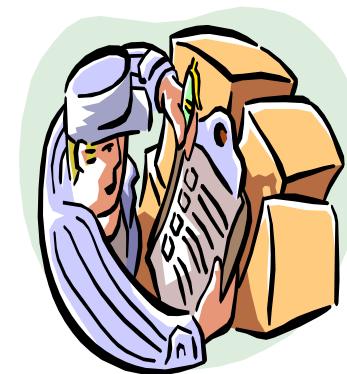
Alternative Fuels are supplied under Posts, Camps and Stations (PC&S) FOB Destination Contracts



Quality Assurance criteria and responsibilities are defined in E Clauses of the contract



Contractors are responsible for having a Quality System and product Quality assurance including maintaining records, sampling and testing of product





Quality Assurance Requirements



Government Quality Activities



Government Inspection and Acceptance are usually by receiving activities at destination



Receiving locations should report delivery and quality problems to contracting officer and quality problems to DESC-BQ



Contractor may be required to submit samples to government laboratory



Government reserves right to perform quality inspections at all time



Alternative fuels are commercial products and there is no government inspection at the vendor facilities





Handling & Storage Strategy



Diesel/ Biodiesel (B20)

Standard diesel fuel is also refined to be consumed
With minimum storage time.

Standard diesel fuel is blended with additives to
improve cold temperature storage.



Biodiesel fuel storage requirements
are similar to those of standard diesel.

Additives are available which can
assist with storage and cold temperature
handling

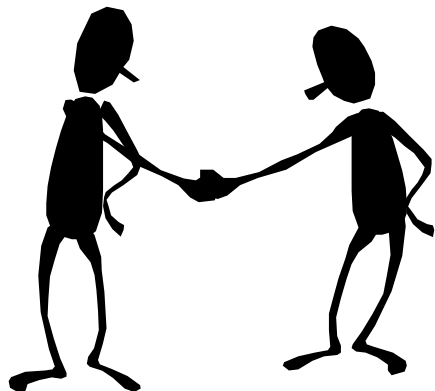




Supplying DoD with Biodiesel



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✓ **Every supplier of pure biodiesel fuel must be registered!**

OR



✓ **Third party non-registrants can show registration of the supplier .**

+

✓ **A cover letter acknowledging that he is the very current supplier**





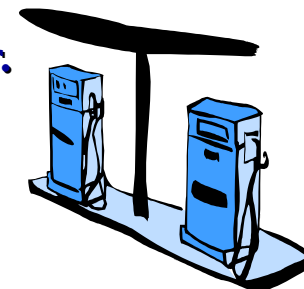
A Common Accepted Blending Method



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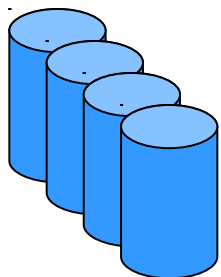
1. Diesel fuel is picked up at supplier loading rack and driven to B100 supplier.
2. The warm/hot B100 is added to the diesel fuel
3. Blending occurs during transportation to the customer.

3 Customer

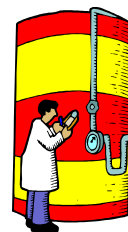


1

Diesel
Fuel Supplier



Note: Hit space bar to drive
truck to destination 2 and 3



2

Biodiesel
(B100)
Supplier





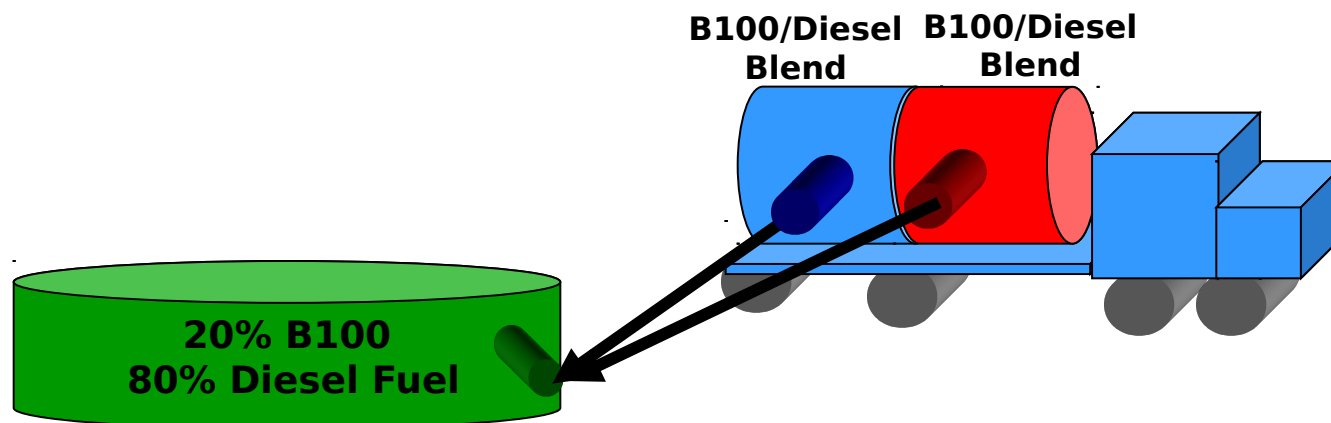
Compartment Blending of Biodiesel



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Blending in a compartmentalized truck IS acceptable WHEN:

Each compartment of the truck contains a biodiesel blend (BXX). The net discharge into receipt tank must be B20!!!



Note: The product in each compartment may not be equivalent to B20 but when all compartments are discharged to receipt tank, the composition must be 20% biodiesel.





Storage Stability



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- **Although the product is improving constantly, storage stability still remains a concern**
- **Data shows that yellow grease blendstock may actually be a bit more stable in storage (the DESC 16.27 clause now permits B100 from a yellow grease feedstock)**
- **Storage stability additives are being perfected**
- **B20 should never be ordered any more than monthly during periods of temperature change**
- **DESC will not supply product if it does not meet the specification requirements**





Cold Weather Concerns



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- **It is critical that product meet the tenth percentile of the ASTM D975 diesel fuel specification for cloud point (CFPP can be substituted for cloud point with the appropriate adjustment to the required low temperature)**

But there is hope.....



- **Cold temperature additives are being developed to work specifically with Biodiesel and are approved for use in admin vehicles**





Key Advantages of Biodiesel Fuel (B100)



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- ✓ **Made from waste products**
- ✓ **Use with standard, existing equipment**
- ✓ **Reduces CO₂ emissions by more than 75%**
- ✓ **Can be used in conventional diesel engines**
- ✓ **Fewer particulate emissions of CO and sulfur dioxide**
- ✓ **Potentially safer to transport and store:
flashpoint of (150 C-typical vs. 77 C-typical for petroleum diesel)**





Present Limitations of Biodiesel Fuel



- X **Warranties with engine manufacturers**
- X **Increase in NOx emissions relative to petroleum diesel**
- X **Limited capacity at present (limited quantities available)**
- X **Cold weather concerns**
- X **Limited approved distribution access
(none in New England / one in S. East)**





Summary



You now know....

- The definition of biodiesel fuel and biodiesel fuel blends
- The role of biodiesel fuel as an EPCA 2005 alternative fuel
- How biodiesel fuel is made
- The advantages and disadvantages of using biodiesel fuel
- Physical and chemical properties of biodiesel fuel/B20 biodiesel blend
- The handling and storage requirements for biodiesel





Frequently Asked Questions



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What is Biodiesel?

PRODUCT DEFINITIONS

BIODIESELS- Mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats

BIODIESEL BLENDS (Bxx)- Blends of biodiesel fuel with petroleum based diesel fuel.





Frequently Asked Questions



Why do I need to use Biodiesel?

Energy Policy Act (EPAAct) 2005

Energy Policy Act (EPAAct) 1992

EO 13423

DoD Strategy

These legal regulations require the Use of Biodiesel where applicable vehicles



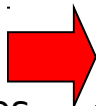


Frequently Asked Questions

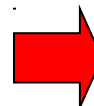


How do I acquire Biodiesel DOD's logistics system?

DESC buys fuel and energy products for both Military and Federal Civilian Agencies



Military groups submit Requirements to Service Energy Offices



Federal agencies submit requirements directly to DESC

What are storage and handling requirements for Biodiesel

Biodiesel fuel storage requirements are similar to those of standard diesel.

Additives are available which can assist with storage and cold temperature handling





Frequently Asked Questions



Does biodiesel affect how my engine operates?

Please refer to GSA websites. Biodiesel blends of 20% or less should not change the engine performance in a noticeable way.

www.gsa.gov/biodiesel

Does biodiesel void my warranty?

Please refer to GSA websites. GSA supports efforts to meet government mandates through use of B20; however, manufacturers may not honor warranty repairs that are linked to problems caused by the use of fuels that are greater than 5% biodiesel.

GSA Fleet will contact the

Manufacturer to obtain warranty coverage. Outside warranty repairs will have to be billed to your agency.

www.gsa.gov/biodiesel





Frequently Asked Questions



Who is using biodiesel?

The largest user of B20 is the U.S. Department of Defense. Many other federal, state, and alternative fuel provider fleets are also using B20, because it allows them to comply with EPA's Regulations.

Are there standards for biodiesel?

ASTM D-975 Specification

Clause C16.27 B20 Biodiesel (DESC Apr 2005)

Do I need to modify my vehicle to use biodiesel?

No vehicle modifications appear to be necessary for blends of biodiesel as high as 20% biodiesel mixed with diesel fuel. Higher blend levels may require minor modification to seals, gaskets, and other parts.





Frequently Asked Questions



Does biodiesel raise NOx emissions?

Biodiesel actually increases NOx emissions compared to conventional fuel.

Can I use biodiesel in cold climate?

Biodiesel will have storage requirements comparable to standard diesel. Additives are still being developed to be approved to blend with biodiesel for cold storage applications.





Information Resources



The U.S. General Services Administration (GSA) has published policy on b use and the federal fleet report

<http://www.gsa.gov/behiclepolicy> (federal fleet report)

The National Biodiesel Board (NBB) has published guidelines for biodiese Handling and use.

**<http://www.nrel.gov/vehiclesandfuels/npbf/40555.pdf>
Chapter 9: FAQ Biodiesel handling and use guidelines**

